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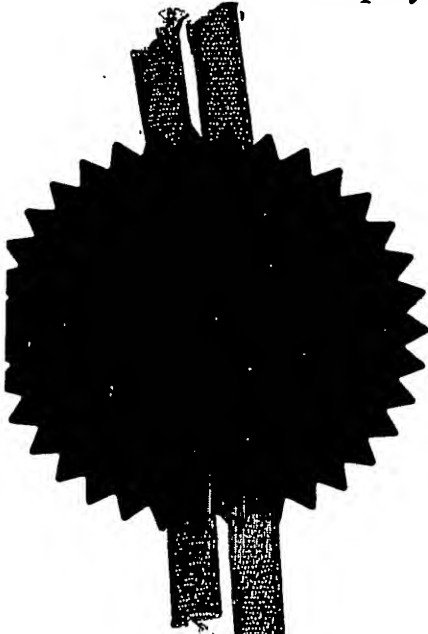
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GB0302853.7

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of:-

BEAUTY SOURCE LTD
Incorporated in the United Kingdom
Hawthornden
3 Cranmer Street
Nottingham
NG3 4GH
United Kingdom

ADP No. 08822744001

07FEB03 E783351-1 002866
P01/7700 0.00-0302853.7

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Patents Act 1977
(Rule 16)THE PATENT OFFICE
- 7 FEB 2003
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1/77

Request for grant of a patent

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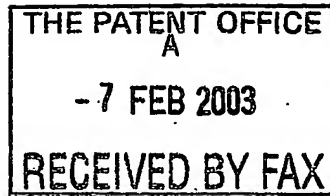
1. Your reference	NSNC / P27973GB		
2. Patent application number (The Patent Office will fill in this part)	0302853.7		07 FEB 2003
3. Full name, address and postcode of the or of each applicant (<u>underline all surnames</u>)	NSN Technologies Limited Unit 51 Hinckley Workspace Southfields Road Hinckley, Leicestershire LE11 1QB United Kingdom		
Patents ADP number (if you know it)	38156 1219001		
If the applicant is a corporate body, give the country/state of its incorporation	United Kingdom		
4. Title of the invention	TANNING BOOTH		
5. Name of your agent (if you have one)	ERIC POTTER CLARKSON		
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	PARK VIEW HOUSE 58 THE ROPEWALK NOTTINGHAM NG1 5DD		
Patents ADP number (if you know it)	1305010 ✓		
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day / month / year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application		Date of filing (day / month / year)
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:	YES		
a) any applicant named in part 3 is not an inventor; or b) there is an inventor who is not named as an applicant; or c) any named applicant is a corporate body. See note (d))			

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Description 11 ✓

Claims(s) 3 ✓

Abstract 1 ✓

Drawing(s) 4 ✓

10. If you are also filing in any of the following, state how many against each item.

Priority Documents 0

Translations of priority documents 0

Statement of inventorship and right to grant of a patent (Patents Form 7/77) YES ✓

Request for preliminary examination and search (Patents Form 9/77) YES ✓

Request for substantive examination (Patents Form 10/77) NO

Any other documents (please specify)

11. I/we request the grant of a patent on the basis of this application.

Signature
ERIC POTTER CLARKSONDate
7 February 2003

12. Name and daytime telephone number of person to contact in the United Kingdom 0115 9552211

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DUPLICATE

TANNING BOOTH

5 This invention relates to a booth in which a person may have a product such as a cosmetic product applied to her skin. The invention relates particularly to a tanning booth in which a person positioned within the booth may have a sunless tanning lotion applied to her skin.

10 Recently public awareness of the harmful side effects of the sun's rays has become higher. It is well known that too much exposure to the sun can lead to skin cancer. Because of this risk, the popularity of cosmetic products which provide a "sunless" tan has increased significantly over recent years.

15 Existing sunless tanning lotions are often in the form of creams or lotions that may be self applied to the skin. A problem with such creams and lotions is that it is very difficult to ensure an even tan since the tan often is not visible until sometime after the cream or lotion has been applied to the skin.

20 It is also known to have such creams and products applied by a beautician. The advantage of this method is that a more even tan is usually achieved.

25 More recently it has been known to apply a sunless tanning lotion to the skin of a person with an air brush. This known method involves a beautician applying a sunless tanning lotion to a client using an air brush to spray the sunless tanning product over the skin of the client to achieve an even coverage over the skin.

30 A problem with this existing method is that although tanning products are not harmful when inhaled by beauticians applying the product to clients

may be exposed over significant periods of time to particles of sunless tanning lotion which may "hang" in the atmosphere during and after the air brushing process. In addition, a client to which the product is applied is often surrounded by a mist of the tanning product during and after the spraying process and so may inhale a significant quantity of the product during the tanning process. This can cause discomfort.

According to a first aspect of the present invention there is provided a booth for accommodating a person the booth defining a booth volume and comprising:

a base portion and a top portion;
flow means for causing a downward air flow within the booth; and
projecting means for projecting a product onto at least some of the booth volume within the booth and onto a body of a person positioned in the booth.

The booth is adapted to accommodate a person requiring a product to be applied to her skin. The downward air flow within the booth means that the product projected within the booth and therefore onto the body of a person positioned within the booth is carried downwards in the air flow. This means that fewer particles of the product remain in the atmosphere and therefore fewer particles will be inhaled by either the person receiving the tan or the beautician, or both.

The booth is preferably used to apply a cosmetic product to the skin of the user. The cosmetic product could be any of a range of products such as skin moisturisers, but preferably the cosmetic product is a sunless tanning product.

Advantageously, the flow means comprises a first plenum of positive pressure located in the top portion of the booth, and a second plenum of negative pressure that is located in the base portion of the booth. The first and second plenums therefore result in the downward flow of air from the first plenum towards the second plenum.

The downward air flow may be arranged to occupy a predetermined volume within the booth. A person occupying the booth may stand in this predetermined volume during and after the tanning process.

Advantageously, the predetermined volume comprises a portion only of the booth volume.

This means that a beautician or other operator applying the sunless tanning lotion to a client may stand outside of the predetermined volume when applying the lotion to the client. This reduces the exposure of the operator to the tanning lotion.

Similarly, a client may leave personal belongings in a portion of the booth situated outside of the predetermined volume, which belongings will therefore not be exposed to the particles of sunless tanning lotion.

Preferably, the booth further comprises recirculating means for recirculating the air within the booth. The recirculating means comprises any suitable air moving device such as a fan. The air moving device is used to maintain the pressure differential between the first and second plenums and therefore contribute to the down flow of air within the booth.

Conveniently the first plenum pressurises air in excess of the ambient atmospheric pressure and the second pressure depressurises air to less than the ambient atmospheric pressure.

- 5 Advantageously the first and second plenums are connected to a duct in which the air moving device is located. The first and second plenums, the duct, the air moving device and the booth volume together form an air management system.
- 10 Advantageously, the booth further comprises a filter. The filter filters out particles of the product circulating within the booth.

- Preferably the booth further comprises temperature means for controlling the temperature of air circulating within the booth. The temperature means
- 15 may comprise a heater which heats the air or alternatively may comprise a cooler which cools the air.

- The projecting means may comprise a hand held tool such as an air gun. The air gun allows an operator to utilise a small hand held spraying tool to
- 20 spray a sunless tanning product onto the skin of a client. However many different products may be sprayed through the unit.

Alternatively the hand held tool could be an airless sprayer.

- 25 Conveniently the operator stands in a portion of the booth outside the predetermined volume, and the client being sprayed stands within the predetermined volume defined by the downward air flow.

- Preferably however, the projecting means comprises a remotely operated
- 30 tool.

Advantageously, the remotely operable tool comprises a plurality of nozzles that project the product into the predetermined volume. This means that when a client is standing in the predetermined volume defined by the downward air flow, the remotely operated tool will direct a spray of product onto the client.

Preferably, the remotely operated tool comprises adjustment means for adjusting the height of the nozzle. This means that a client may stand within the predetermined volume while the height of the nozzle is adjusted in order to ensure complete and even coverage of the body of the client by the product.

Preferably, the adjustment means additionally adjusts the attitude of the nozzle. This means that the angle at which the product is incident on the body of a client may be varied in order to ensure consistent overall coverage of the product on the client's skin.

According to a second aspect of the present invention there is provided a tool for projecting a product into a booth, the booth comprising a base portion and a top portion, and flow means for causing a downward air flow within the booth.

According to a third aspect of the present invention there is provided a method of applying a product to a human body using a booth defining a booth volume and comprising;

a base portion and a top portion;

flow means for causing a downward air flow within the booth; and

projecting means for projecting a product onto at least some of the booth volume within the booth and onto a body of a person positioned in the booth.

- 5 The invention will now be further described by way of example only with reference to the accompanying drawings in which;

Figure 1 is a schematic representation of a first embodiment of a booth according to a first aspect of the present invention;

- 10 Figure 2 is a schematic representation of a second embodiment of a booth according to a first aspect of the present invention;

Figure 3 is a schematic representation of the projecting means forming part of the booth of Figure 2;

15

Figures 4a, 4b and 4c are schematic representations of a variation of the booth of Figure 1;

- Figures 5a, 5b and 5c are schematic representations of a variation of the
20 booth shown in Figure 2; and

Figure 6 is a schematic representation of the air flow within the booth shown in any one of Figures 1 to 5.

- 25 Referring to the figures a first embodiment of a booth according to the present invention is shown in Figures 1 and 6 are designated generally by the reference numeral 2. The booth defines a booth volume also known as a spray chamber 4 and comprises a base portion 6 and a top portion 8. The booth 2 comprises an upper plenum 10, and a lower plenum 12. The upper
30 plenum has a positive pressure with respect to atmospheric pressure, and the

lower plenum has a negative pressure with respect to atmospheric pressure. This pressure difference causes a downward flow of air in the direction of arrows 14 (see Figure 6) of air circulating within the booth 2. The booth 2 further comprises a duct 16 comprising an air mover 18 in the form of for example a fan. The air mover 18 positioned in the duct 16 allows air to be recycled within the booth 2.

The booth further comprises a filter 20, the purpose of which will be described further herein below.

10

The booth 2 is used to enable a person such as a client of a beauty salon to obtain an even tan through application of a sunless tanning lotion applied by an operator using an air gun.

15 The client to be tanned stands on the floor 22 of the booth 2 within a predetermined volume in which the down flow of air exists. An operator using an air gun (not shown) may stand at the operator access opening 24 which is outside the predetermined volume within which there is a downward air flow. The spray gun is attached to a supply of the tanning product to be applied to the client's skin. The spray gun causes the product to be sprayed onto a client's skin.

25 By means of the present invention therefore a highly specific and controlled delivery of atomised products such as a sunless tanning product may be applied to the client. There is no need for the client to manually manipulate the product once it has been applied to the skin in order to ensure even coverage.

30 During the act of spraying, the tanning product becomes air borne in the form of small droplets. The downward air flow of the present invention

ensures that these small droplets are kept away from the client and the operator and that a clean supply of air for both the operator and the client is available. The filter 20 serves to filter out particles of the product to ensure that the recirculating air is as clean as possible.

5

Because there is a need for operator access, the downward air flow prevents air loss by the operator access opening 24. A percentage of the air flow is bled off from the first plenum 10 in order that the differential between the air volume being drawn from the booth volume 4 into the second plenum and the air volume being moved into the booth volume 4 from the first
10 plenum 10 is replaced by air movement into the downward flow of air within the booth volume from outside the booth 2 via the operator access opening 24. This management of the air flow prevents any outward flow of particles from the booth volume 4 during the spraying process and ensures
15 that all particles generated within the booth volume 4 must pass through the filter 20 thus ensuring that the client and the operator are maintained in clean air.

A downward flow of air is the most efficient way to move air over a human
20 body as moving air downwards over a body ensures that the body presents a minimum cross sectional area of impedance to the air flow.

The downward air flow capitalises on the tendency for heavy atomised particles to drop downwards under the influence of gravity. The downward
25 air flow thus uses gravity to assist in the process of extracting particles generated by the spraying tool from the booth volume 4.

Since air is recycled within the booth 2, it will not be necessary for a purchaser of the booth 2 to carry out building work to their premises in
30 order to create ductwork to the atmosphere. By using a recirculating air

stream there is no need for any building work to be carried out since no ductwork to the atmosphere is required.

The booth 2 further comprises a heater 26 which warms the air in the downward air flow. The combination of spraying a wet product onto a client's skin in conjunction with an air stream moving over the body of a client creates a "chill factor". By means of the heater 26 it is possible to ensure that air passing over the body of a client is at an appropriate temperature. Further, after the spraying process has been completed, a client may be dried by the air flow.

Turning now to Figure 2, a second embodiment of the invention is designated generally by the reference numeral 28. For all parts which correspond to parts shown in Figure 1, the same reference numerals have been used for clarity. In addition, the air flow within the booth 28 is similar to that within the booth 2 shown in Figure 1, and Figure 6 also relates to the air flow within the booth 28.

Booth 28 comprises a remotely operable tool 30 (shown in Figure 3) for applying a sunless tanning product to a client. The booth is similar to the booth shown in Figure 1 but additionally comprises doors 32 which may be closed once a client has entered the booth 28. The tool 30 comprises a plurality of nozzles 34 supported by a nozzle support 36 which is generally circular in shape. The nozzle support 36 is mounted on a post 38 which is attached to a power circuit, fluid circuit and air circuit forming part of the booth 28.

The tool 30 is an automated system which allows a client to be sprayed with a sunless tanning lotion, for example, without the need of an operator. The nozzle support 36 is the form of a lasso which provides mounting points for

- several nozzles 34 around its perimeter. The lasso then descends over the client standing in the area of the down flow of air and the nozzle delivers the product to be applied to the client in a metered manner. The tool 30 also contains means for adjusting the angle of the nozzles in order that each
- 5 nozzle may move through an arc pointing alternately upward and downward to vary the angle of incidence of the product on the client during the spray cycle. This ensures that the client's skin receives a comprehensive coating of the product and further removes the necessity for manually manipulating the product once on the skin. The client remains in a static position during
- 10 the spraying process. Following the spraying process the client remains within the heated recirculating air flow in order to allow the product to completely and quickly be dried upon the skin by the heated recirculating air flow.
- 15 A further advantage of the tool 30 is that once the lasso 36 has moved below the head of the client, the downward air flow ensures that a minimum amount of spray will come into contact with the client's face. The client is therefore able to breath freely during almost all of the spraying process.
- 20 A client entering the booth 28 must hold onto handles (not shown) positioned above the head of the client in order to start the operation of the tool 30. The handles also serve to place the client in the correct position for application of the product. Should the client release a handle at any time during the operation of the tool 30, all movement of the tool will
- 25 immediately cease. Movement will not resume until the client regrasps the handles.

Although the invention as hitherto been described with reference to a heating apparatus for heating the air flowing through the booth, it is

envisaged that in warmer climates or during the summer of temperate climates it may be advantageous to cool the air flow.

- It will also be possible to "upgrade" the version of the booth shown in Figure 1 in which an operator is required to apply the product to a client to the version of the booth shown in Figure 2 in which the product is applied automatically. This could be done by installing tool 30 into booth 2, and fitting doors to the booth.
- 10 Referring to Figures 4a, 4b and 4c a variation of the booth in Figure 1 is shown. Similarly Figures 5a, 5b and 5c show a variation of the booth shown in Figure 2.

CLAIMS

1. A booth for accommodating a person defining a booth volume and comprising:
 - 5 a base portion and a top portion;
flow means for causing a downward air flow within the booth; and
projecting means for projecting a product onto at least some of the booth volume within the booth and onto a body of a person positioned in the booth.
- 10 2. A booth according to Claim 1 wherein the product comprises a cosmetic product.
3. A booth according to Claim 1 or Claim 2 wherein the cosmetic
15 product is a sunless tanning product.
4. A booth according to any one of the preceding claims wherein the flow means comprises a first plenum of positive pressure located in the top portion of the booth, and a second plenum of negative pressure located in
20 the base of the booth.
5. A booth according to any one of the preceding claims wherein the downward air flow occupies a predetermined volume within the booth.
- 25 6. A booth according to Claim 5 wherein the predetermined volume comprises a portion of the booth volume.
7. A booth according to any one of the preceding claims further comprising recirculating means for recirculating the air within the booth.

30

8. A booth according to Claim 7 wherein the recirculating means comprises a fan.
9. A booth according to Claims 7 or Claim 8 wherein the recirculating means comprises a filter.
10. A booth according to any one of the preceding claims further comprising temperature means for controlling the temperature of the air.
11. A booth according to Claim 10 wherein the temperature means heats the air.
12. A booth according to Claim 10 wherein the temperature means cools the air.
13. A booth according to any one of the preceding claims wherein the projecting means comprises a hand held tool.
14. A booth according to Claim 13 wherein the hand held tool comprises an air gun.
15. A booth according to Claim 13 where the hand held tool comprises an airless sprayer.
16. A booth according to any one of Claims 1 to 12 wherein the projecting means comprises a remotely operable tool.
17. A booth according to Claim 16 wherein the remotely operable tool comprises a plurality of nozzles adapted to project the product into the predetermined volume.

18. A booth according to Claim 17 wherein the remotely operable tool further comprises adjustment means for adjusting the height of the nozzles.
- 5 19. A booth according to Claim 18 wherein the adjustments means additionally adjusts the attitude of the nozzles.
20. A booth according to any one of Claims 15 to 19 wherein the remotely operable tool comprises a nozzle support defining a substantially
10 circular shape, the nozzles being positioned to spray the product into an area defined by the nozzle support.
21. A tool according to any one of Claims 15 to 19.
- 15 22. A method for applying a product to a human body using a booth as claimed in any one of Claims 1 to 20.
23. A method of applying a product to a human body using the tool of Claim 21.
20
24. A booth substantially as herein before described with reference to the accompanying drawings.
25. A tool substantially as herein before described with reference to the
25 accompanying drawings.
26. A method substantially as herein before described with reference to the accompanying drawings.

ABSTRACT

A booth for accommodating a person defining a booth volume and
5 comprising:

a base portion and a top portion;

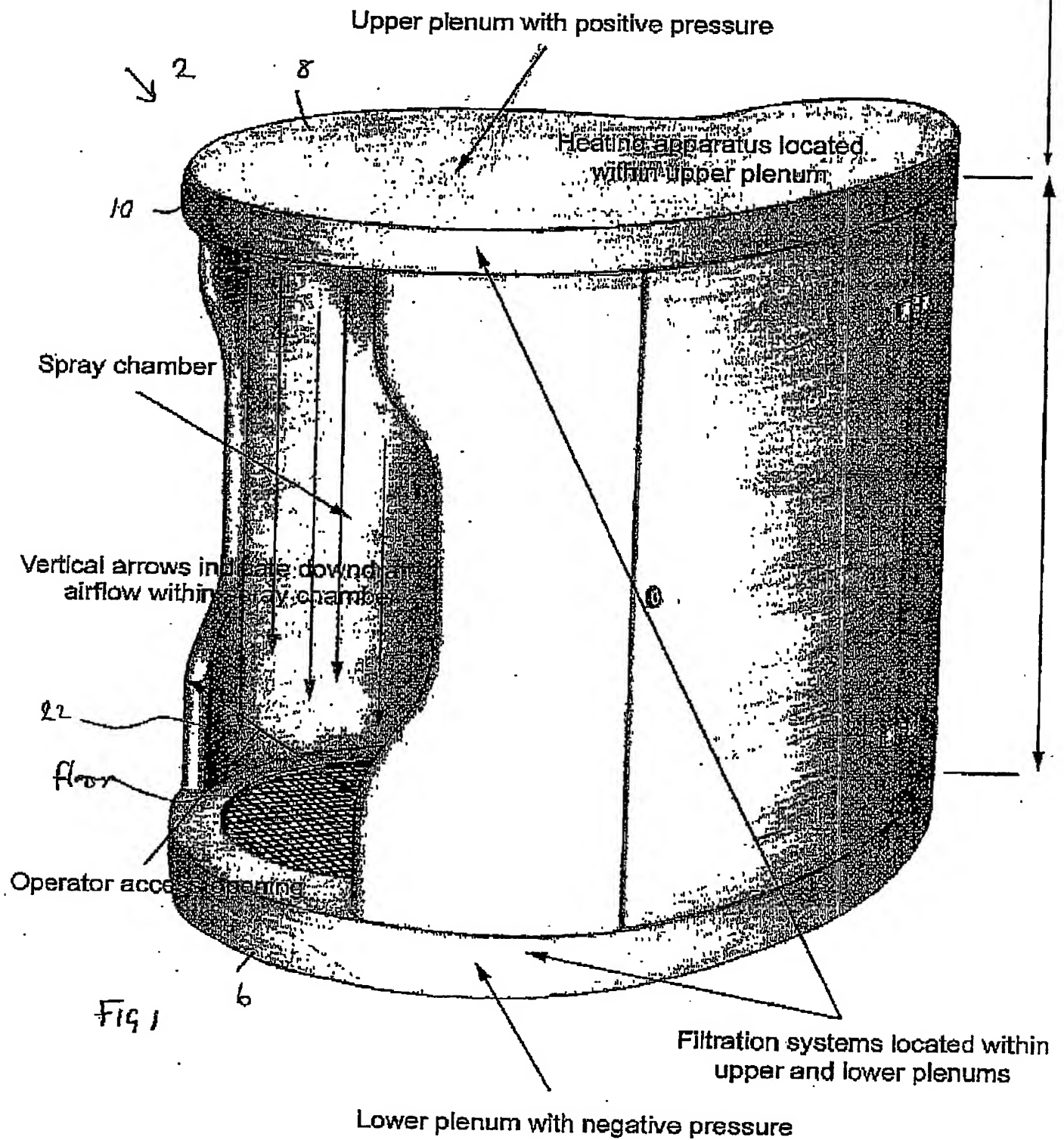
flow means for causing a downward air flow within the booth; and

projecting means for projecting a product onto at least some of the
booth volume within the booth and onto a body of a person positioned in the
10 booth.

Figure No 2

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Duct and air mover
located within here to connect
upper and lower plenums



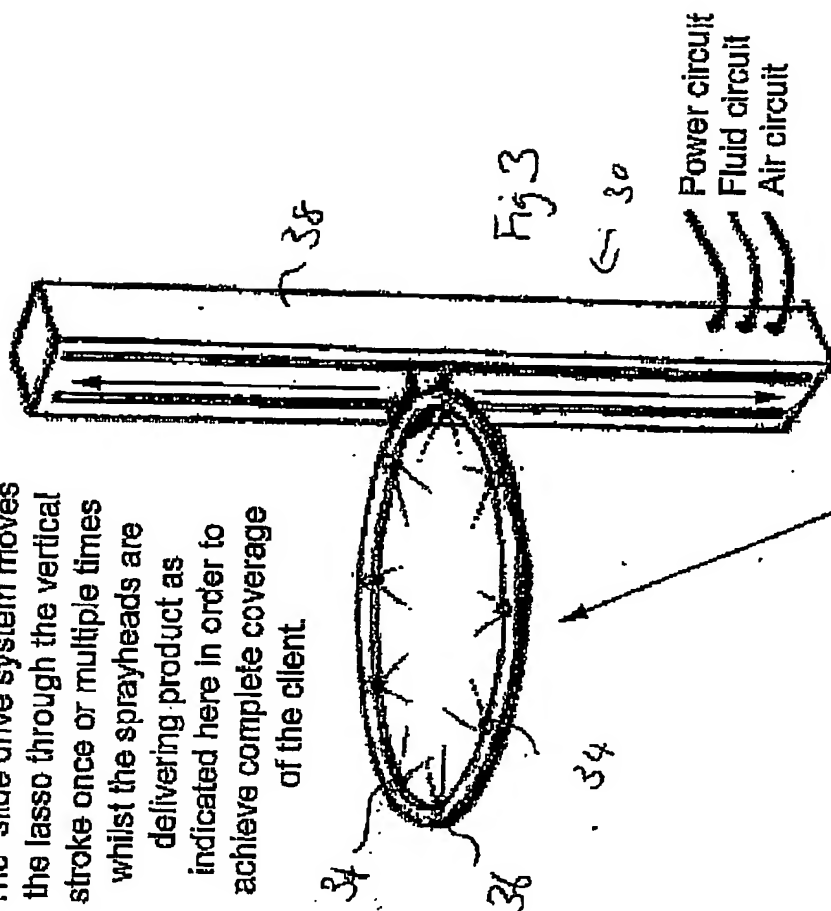
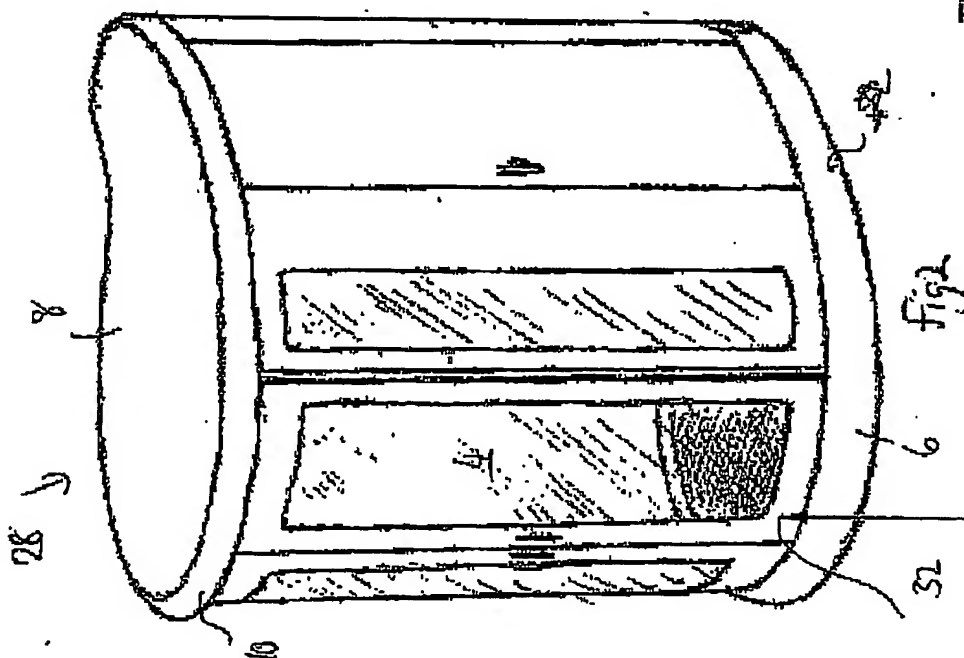
Note - this diagram represents only one possible orientation of these component parts

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Other than those shown, other modifications are also made to AirPort I in order to convert it fully to AirPort II. However, these constitute the main functionality alterations.

The fluid delivery system, air delivery system and also several aspects of the control system are upgraded in the modification of AirPort I to create a fully functional AirPort II.

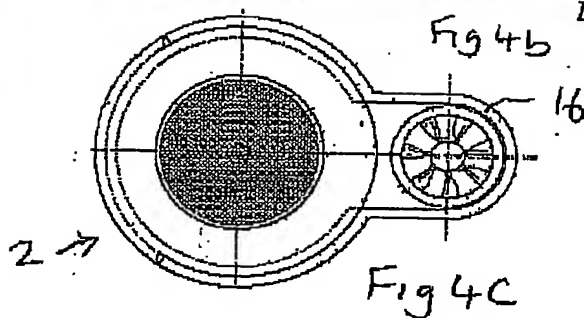
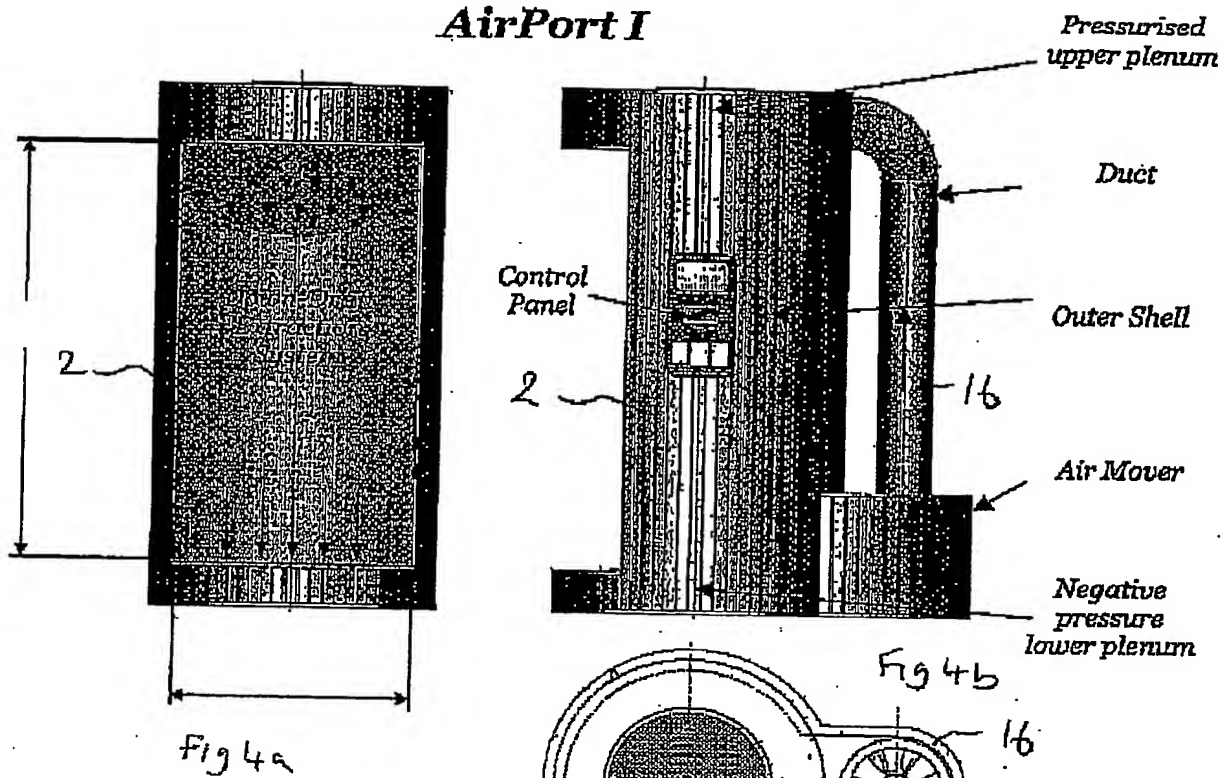
The slide drive system moves the lasso through the vertical stroke once or multiple times whilst the sprayheads are delivering product as indicated here in order to achieve complete coverage of the client.



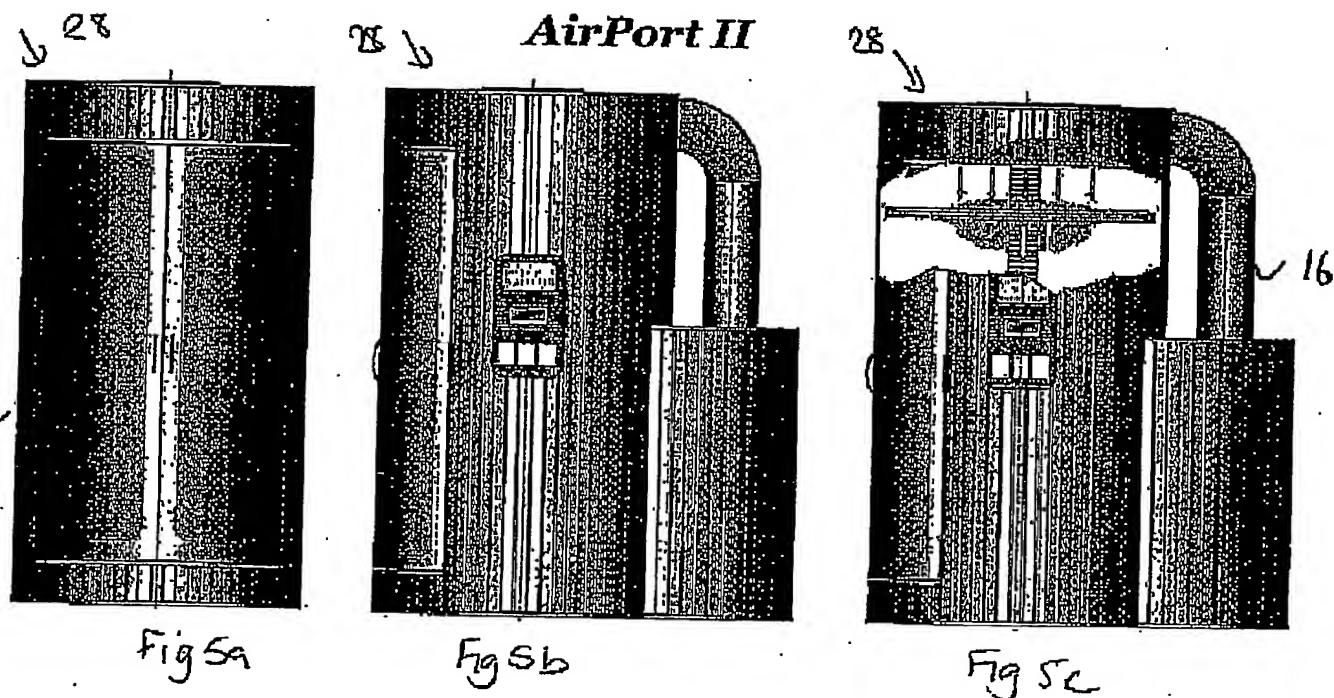
This constitutes the unmanned spray lasso and slide drive system. In order to convert AirPort I into AirPort II, this unit is installed into the AirPort chassis. Doors are also retro-fitted as shown opposite.

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AirPort I



AirPort II



4/4

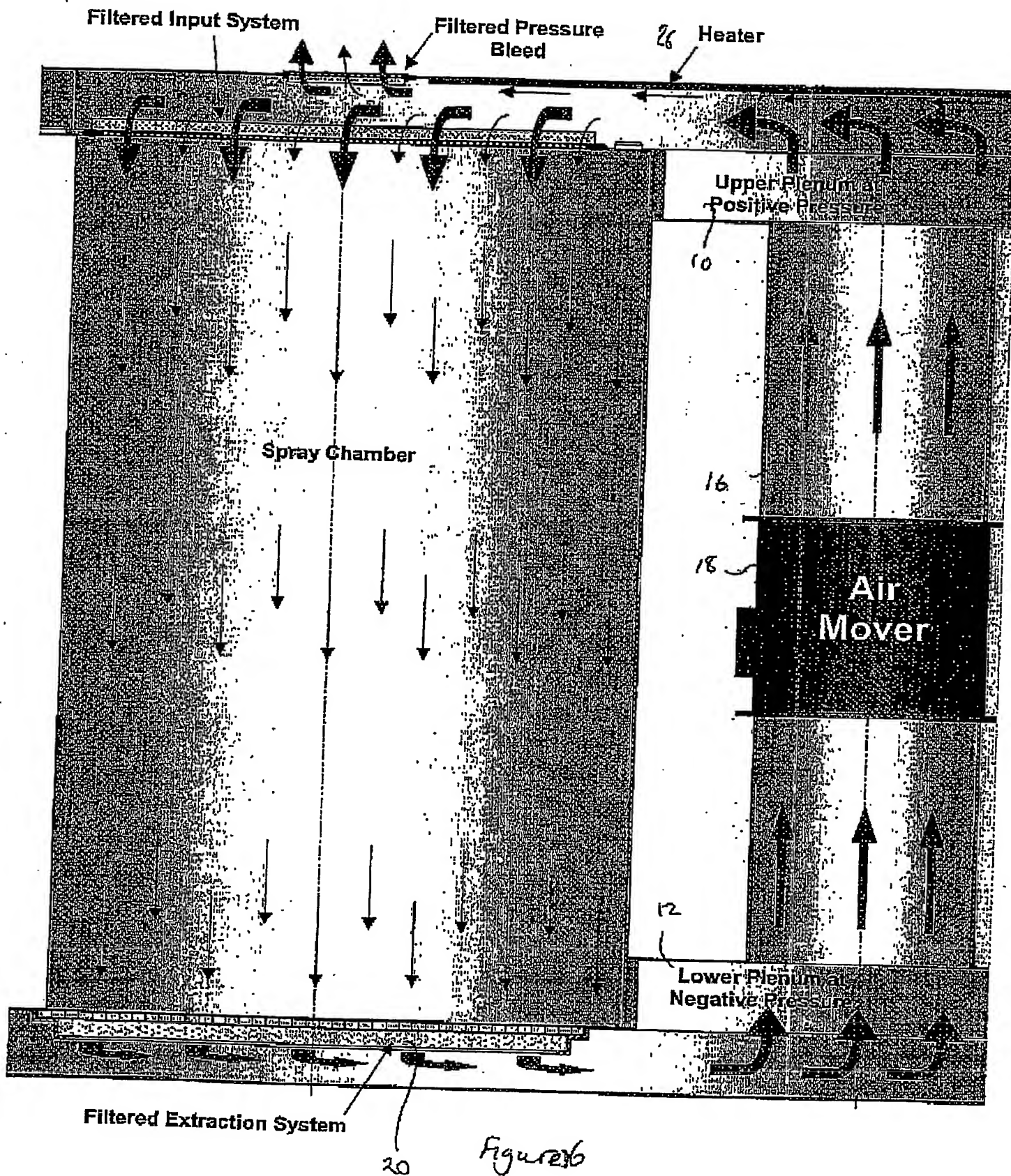


Figure 2b